



## The Company

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The UKAS Calibration Laboratory No. 0255 is just one of the ten flow calibration plants operated by the Company and is indicative of our dedication to quality and accuracy.

EN ISO 9001:2000



Cert. No. Q 05907

EN 29001 (ISO 9001)



Lenno, Italy – Cert. No. 9/90A

Stonehouse, U.K.



## Electrical Safety

This equipment complies with the requirements of CEI/IEC 61010-1:2001-2 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use'. If the equipment is used in a manner NOT specified by the Company, the protection provided by the equipment may be impaired.

## Symbols

One or more of the following symbols may appear on the equipment labelling:

	<b>Warning</b> – Refer to the manual for instructions
	<b>Caution</b> – Risk of electric shock
	Protective earth (ground) terminal
	Earth (ground) terminal

	Direct current supply only
	Alternating current supply only
	Both direct and alternating current supply
	The equipment is protected through double insulation

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Technical Publications Department.

### Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

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## 1 Introduction

The AAO100 dosing pump is used to introduce a cleaning solution to the jetwash of an AP200 pH system at preset intervals. The timing, duration and amount of cleaning is controlled by the AX400 pH analyzer.

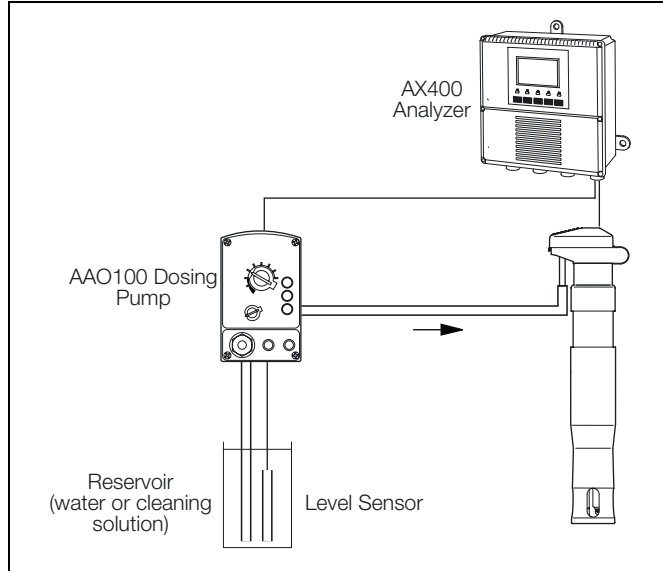


Fig. 1.1 Jetwash Schematic

The AP200 jetwash system enables automatic cleaning of both the measuring element and the reference junction by spraying water or a cleaning solution at them in situ, thus reducing system maintenance requirements.

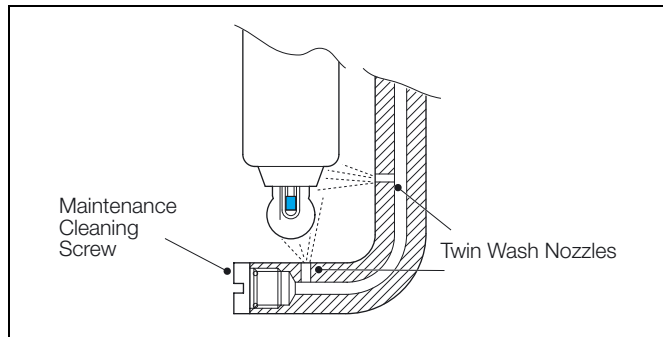


Fig. 1.2 Location of the Jetwash Nozzles

## 2 Installation

**Note.** Installation must be carried out in accordance with local water company and council by-laws.

### 2.1 Fitting the Pump to the Reservoir

Referring to Fig. 2.1, secure the pump to the reservoir using the two screws (A) provided.

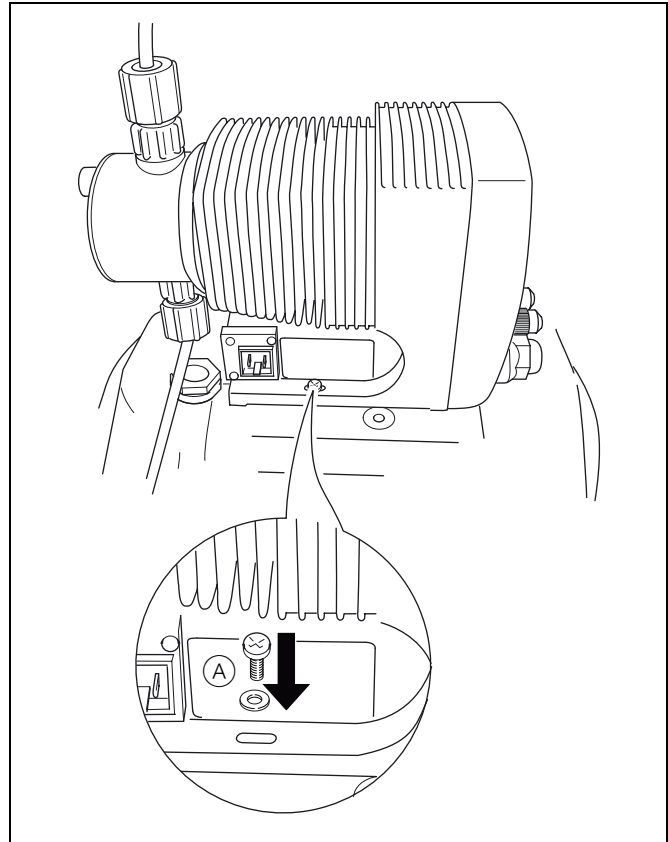


Fig. 2.1 Fitting the Pump to the Reservoir

## 2.2 Electrical Connections

### 2.2.1 Dosing Pump Mains Connections

The power supply range is 100 to 230 V AC.

**Caution.** Before making any electrical connections, ensure that the power supply is switched off.

Referring to Fig. 2.2:

1. Connect the mains plug (A).
2. Push the mains plug into the pump socket (B).
3. Fasten the mains plug cover (C).

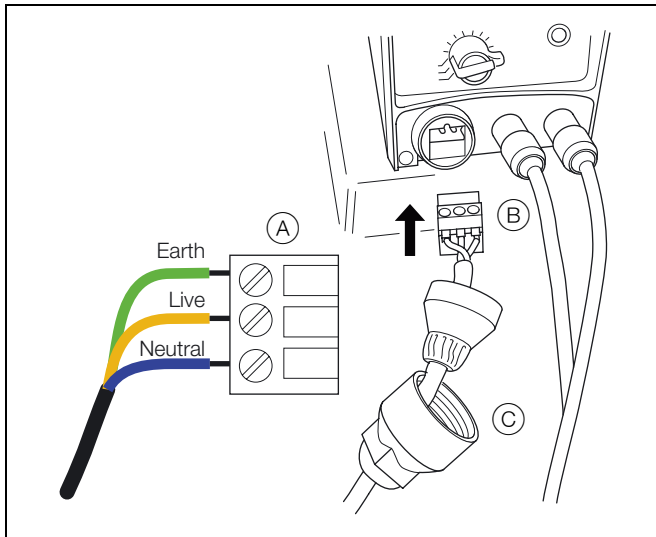


Fig. 2.2 Dosing Pump Mains Connections

### 2.2.2 Analyzer Connections

Referring to Fig. 2.3:

1. Plug the controller cable into the dosing pump (A).
2. Cut the controller cable's Blue wire back to the outer insulation.
3. Remove the analyzer's terminal cover plate – see Section 6.4.1. of the analyzer's User Guide (IM/AX4PH).
4. Twist the controller cable's Black and Brown wires together and connect to terminal A10 (B).
5. Twist the controller cable's White and Grey wires together and connect to terminal A12 (C).
6. Refit the analyzer's terminal cover plate – see Section 6.4.1. of the analyzer's User Guide (IM/AX4PH).

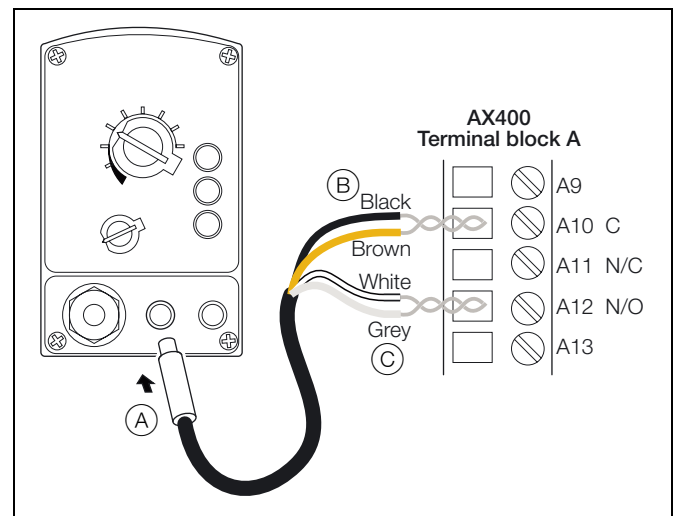


Fig. 2.3 Analyzer Connections

## 2.3 Dosing Pump Settings

For optimum cleaning, set the dosing pump to:

Stroke Length **100**

Multifunction Switch **External** – the AX400 pH Analyzer controls the frequency and duration of the cleaning cycle.

Refer to Section 3, page 6 for analyzer configuration instructions.

## 2.4 Pump Tubing Connections

### 2.4.1 AP200 Connection

**Note.** Wash tubing is not supplied. Use 6mm OD semi-rigid polyethylene tube (part no. 0212035).

Referring to Fig. 2.4:

1. Remove jetwash port sealing nut (A) and retain for further use.

**Note.** The sealing nut must be refitted if the jetwash tubing is removed.

2. Slide the connector (B) and the ferrule (C) onto the tubing.
3. Push the tubing onto the jetwash port (D) and tighten the connector to a torque of 0.6 Nm.

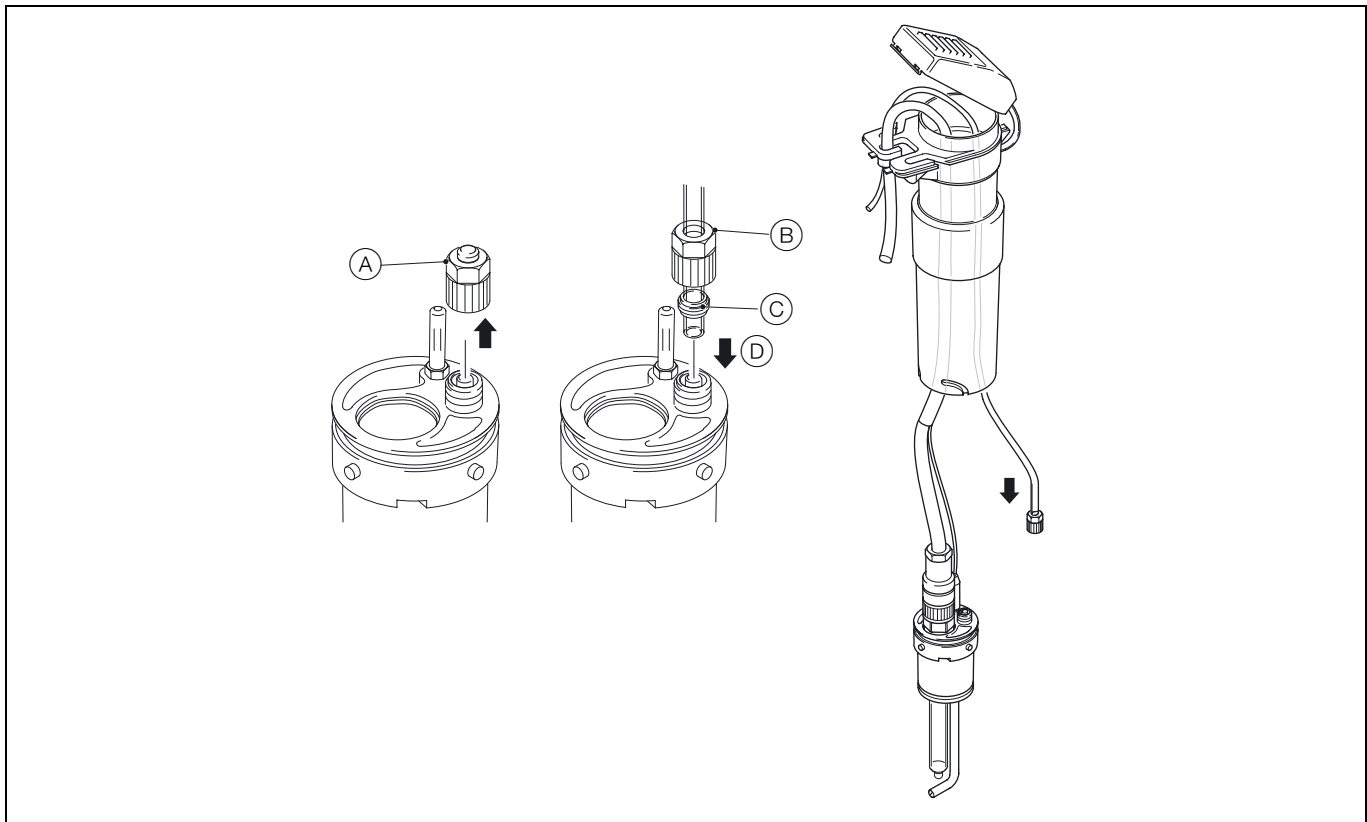


Fig. 2.4 AP200 Connection

### 2.4.2 Connecting the Tubing to the Pump

Referring to Fig. 2.5:

1. Cut the end of the tubing straight across.
2. Slide union nut (A) and circlip (B) over the tubing.
3. Push the end of the tubing over nozzle (C).
4. Ensure that O-ring (D) is seated correctly.
5. Fasten the union nut to valve (E) while pushing the tube onto the nozzle.

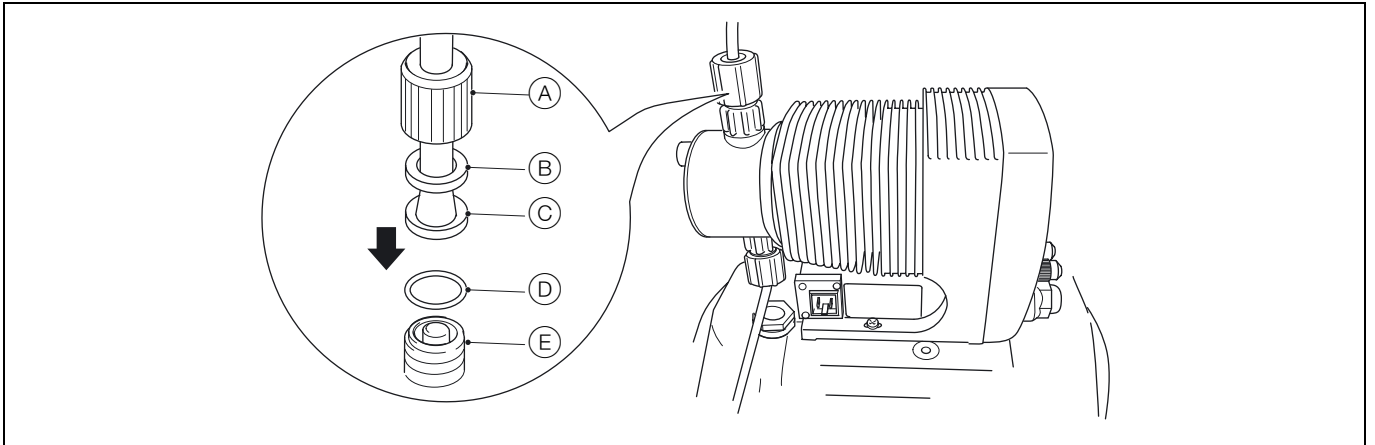
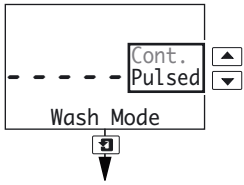


Fig. 2.5 Connecting the Tubing to the Pump

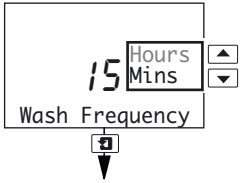
### 3 Analyzer Settings

Access the Wash Cycle Configuration menu – see Section 5 of the AX400 pH analyzer's User Guide (IM/AX4PH).



#### Wash Mode

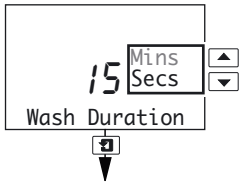
Set to **Cont.** (continuous) for use with the dosing pump.



#### Wash Frequency

Set the wash frequency required.

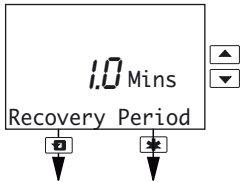
Wash frequency is set in 15 minute increments between 15 and 45 minutes, then in 1 hour increments between 1 and 24 hours.



#### Wash Duration

Set the wash duration required.

Wash duration is set in 15 second increments between 15 and 45 seconds, then in 1 minute increments between 1 and 10 minutes.



#### Recovery Period

Set the recovery period required, between 0.5 and 5.0 minutes in 0.5 minute increments.

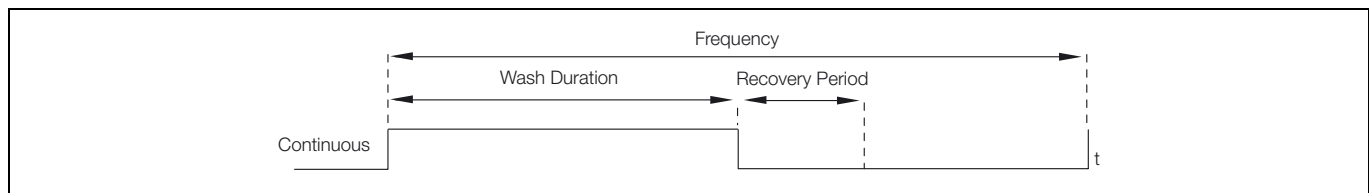


Fig. 3.1 Wash Cycle Frequency

## 4 Cleaning Solutions

The AP200 spray jet tube is constructed in 316 stainless steel. Possible contaminants together with recommended cleaning solutions are shown in Table 4.1.

Contaminant	Cleaning Solution
Grease and oil	Alkaline detergents or water-soluble solvents such as alcohols
Resins	Dilute alkalis
Limestone and carbonates	1M nitric acid
Metal hydroxides	1M sulphuric or nitric acid
Cyanides	
Heavy biological	
Proteins	Mixture of 1M sulphuric or nitric acid and pepsin (saturated)
Fibres	Pressurized water with or without wetting agents
Light biological	Pressurized water
Latex	Pressurized cold water
Potable water	Citric acid

Table 4.1 Recommended Cleaning Solutions

## 5 Dimensions

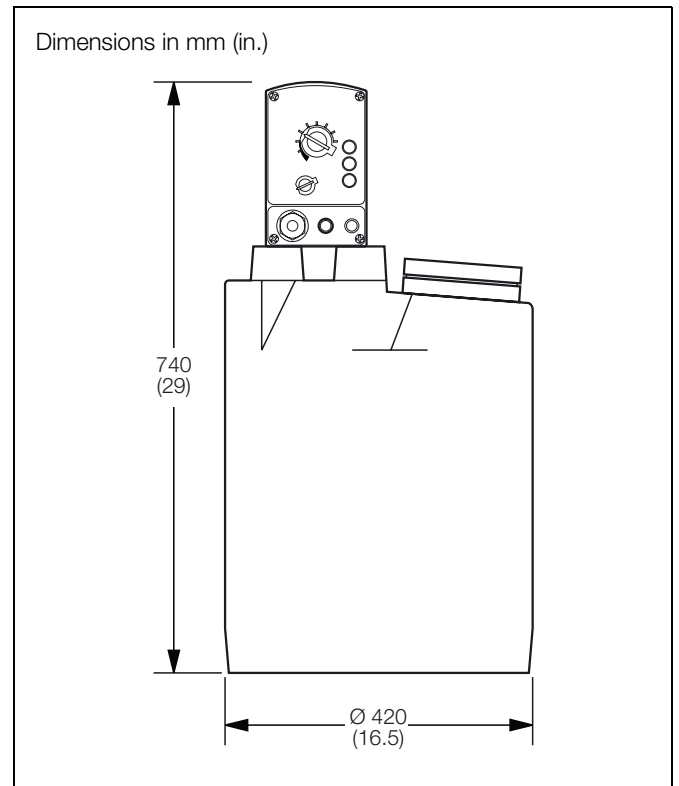


Fig. 5.1 Overall Dimensions

## Notes

# PRODUCTS & CUSTOMER SUPPORT

## Products

### Automation Systems

- for the following industries:
  - Chemical & Pharmaceutical
  - Food & Beverage
  - Manufacturing
  - Metals and Minerals
  - Oil, Gas & Petrochemical
  - Pulp and Paper

### Drives and Motors

- AC and DC Drives, AC and DC Machines, AC Motors to 1kV
- Drive Systems
- Force Measurement
- Servo Drives

### Controllers & Recorders

- Single and Multi-loop Controllers
- Circular Chart and Strip Chart Recorders
- Paperless Recorders
- Process Indicators

### Flexible Automation

- Industrial Robots and Robot Systems

### Flow Measurement

- Electromagnetic Flowmeters
- Mass Flowmeters
- Turbine Flowmeters
- Wedge Flow Elements

### Marine Systems & Turbochargers

- Electrical Systems
- Marine Equipment
- Offshore Retrofit and Refurbishment

### Process Analytics

- Process Gas Analysis
- Systems Integration

### Transmitters

- Pressure
- Temperature
- Level
- Interface Modules

### Valves, Actuators and Positioners

- Control Valves
- Actuators
- Positioners

### Water, Gas & Industrial Analytics Instrumentation

- pH, Conductivity and Dissolved Oxygen Transmitters and Sensors
- Ammonia, Nitrate, Phosphate, Silica, Sodium, Chloride, Fluoride, Dissolved Oxygen and Hydrazine Analyzers
- Zirconia Oxygen Analyzers, Katharometers, Hydrogen Purity and Purge-gas Monitors, Thermal Conductivity

## Customer Support

We provide a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

### United Kingdom

ABB Limited  
Tel: +44 (0)1453 826661  
Fax: +44 (0)1453 829671

### United States of America

ABB Inc.  
Tel: +1 215 674 6000  
Fax: +1 215 674 7183

### Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification.

Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.
2. Copies of all storage, installation, operating and maintenance records relating to the alleged faulty unit.

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**ABB** has Sales & Customer Support expertise  
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The Company's policy is one of continuous product  
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